Life Sciences Outreach Faculty Speaker Series for High School Biology Teachers
How Biologists View Structure and Function
Fall 2018

Making evidence-based claims: frog specimen observations

I (Mara) designed this activity with educators from the Harvard Museum of Natural History as a teacher professional development program to highlight the biodiversity of frogs, and walk through the process of making an evidence-based claim. We will first work with the museum specimens, then I will give a brief talk to go over the answers and my research.

Exercise I: Scientific drawings
Instructions for handling museum specimens: Please keep the museum specimens **wet with ethanol!** When your group is finished sketching a museum specimen, please cover it with cheesecloth soaked in ethanol. Please touch and move specimens, but be gentle! Don't force the specimen to bend.

You have at least two frogs at your station. They could be museum specimens, or 3D prints of museum specimens.

1. Do a scientific sketch of one frog at your station.

2. Compare scientific drawings among your group. What is similar between drawings? What is different? Did any of your group members include something in their drawings that you wish you had included?

Exercise II: Claims, Evidence, and Reasoning Organizer (CER)

This organizer developed by Jennifer Peterson in the HMNH education department is based upon NGSS Science and Engineering Practice, "Engaging in argument from evidence."

Because animals are shaped by their environment, it is possible to make a claim about the environment, habitat, diet, or behavior of the animal. For example, a specimen with sharp teeth is probably a carnivore. The following activity is also provided to you as a handout in your materials.

3. After sketching your frog specimen, what can you claim about the environment or behavior of one of the specimens at your table? Make one claim. (For example, do you think these frogs live predominantly in water or on land or in trees? What do you think they eat? Do you think they hunt during the day or night?

4. For evidence, choose two features (feet, body shape (round/flat/streamlined), or head shape/head features) that support your single claim. Make a more detailed sketch of these two body parts.

5. Provide a brief explanation of the reasoning behind your claim, and how the evidence supports this claim.

6. Take 5 minutes to share your claim, evidence, and reasoning with your group. Mara will give a talk to wrap up the activity.

***Mara and her lab mate Jenni Austiff (right) used photogrammetry to scan museum specimens and 3D print models of the specimens. The Harvard Museum of Natural History (HMNH) will have several sets of these 3D printed specimens that can be loaned to teachers who would like to do this activity in their classroom. The plain STL files should also be available soon for teachers who would like to print the models themselves.*